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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MAREK MATUSZ and
RUTH MARY KOWALESKI

Appeal 2009-013266
Application 10/816,080
Technology Center 1600

Decided: March 2, 2010

Before RICHARD M. LEBOVITZ, JEFFREY N. FREDMAN, and
STEPHEN WALSH, *Administrative Patent Judges*.

FREDMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a process for epoxidation of an olefin. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

Statement of the Case

Background

“In olefin epoxidation an olefin is reacted with oxygen to form an olefin epoxide, using a catalyst comprising a silver component, usually with one or more further elements deposited therewith on a carrier” (Spec. 1, ll. 14-17).

The Claims

Claims 1-30 are on appeal. Claims 1, 9, 17, and 19 read as follows:

1. A process for the epoxidation of an olefin, which process comprises reacting a feed comprising an olefin, oxygen and an organic halide, in the presence of a catalyst comprising silver and rhenium deposited on a carrier, wherein the catalyst comprises rhenium in a quantity of at most 1.5 mmole/kg, relative to the weight of the catalyst, and at most 0.0015 mmole/m², relative to the surface area of the carrier, and in which process the reaction temperature is increased to at least partly reduce the effect of loss of activity of the catalyst while the organic halide is present in a relative quantity Q which is maintained constant, which relative quantity Q is the ratio of an effective molar quantity of active halogen species present in the feed to an effective molar quantity of hydrocarbons present in the feed.

9. A process as claimed in claim 1, wherein the rhenium content of the catalyst is in the range of from 0.1 to 1.2 mmole/kg, relative to the weight of the catalyst, and in the range of from 0.00005 to 0.0013 mmole/m², relative to the surface area of the carrier.

17. A process as claimed in claim 16, wherein the relative quantity Q has been maintained within at most 10 % of the value of Q at the beginning of that temperature increase.

19. A catalyst comprising silver, rhenium and a rhenium copromoter selected from tungsten, molybdenum, chromium, sulfur, phosphorus, boron, and compounds thereof deposited on a carrier, wherein the catalyst comprises rhenium in a quantity of at most 0.9 mmole/kg, relative to the weight of the catalyst, and at most 0.0015 mmole/m², relative to the surface area of the carrier, and wherein the catalyst further comprises the rhenium copromoter in a quantity of at least 0.1 mmole/kg, based on the total of the elements, relative to the weight of the catalyst.

The prior art

The Examiner relies on the following prior art references to show unpatentability:

Lauritzen '738	US 4,808,738	Feb. 28, 1989
Evans '202	US 5,418,202	May 23, 1995
Carlson	CA 488990	Dec. 23, 1952
Habenschuss	CA 1,286,687	Jul. 23, 1991
Lauritzen '850	EP 352 850 A1	Jan. 31, 1990
Shell	WO 95/17957 A1	Jul. 6, 1995
Evans '324	WO 01/96324 A2	Dec. 20, 2001

The issue

The Examiner rejected claims 1-30 under 35 U.S.C. § 103(a) as obvious over Lauritzen '738, Shell, Evans '202, Lauritzen '850, Habenschuss, Carlson, and Evans '634 (Ans. 4-7).

The Examiner finds that Lauritzen '738 "discloses a catalyst for use in olefin epoxidation via olefin, oxygen and halide feed wherein Example 5-2 [is of] a silver containing catalyst having 0.5 mmole rhenium per kilogram catalyst" (Ans. 4). The Examiner finds that in Lauritzen '738, "the

distribution of rhenium is 0.0012 mmole/m² [sic, m²]” (Ans. 4). The Examiner finds that Lauritzen ‘738 teaches that “the temperature is increased during the reaction, and that ‘during the entire test run’ the feed mixture consists of 4.4 to 5.6 ppmv vinyl chloride” (Ans. 5). The Examiner finds that while Evans “does not teach the Q ratio per se, Evans . . . does disclose sufficient data and process parameters to calculate Q. see, for example, column 18 lines 42-47” (Ans. 6-7). The Examiner finds that Evans ‘324 “teaches continuously adjusting the chlorohydrocarbon during the reaction to maintain a certain activity level” (Final. Rej. 3). The Examiner finds that “it is known [to] increase the temperature of the reaction at a rate to maintain a given activity. See Habenschuss et al CA 1286687 page 6 last paragraph and page 7 first paragraph. See also Carlson CA 488990 page 4 lines 18-24” (Ans. 8).

The Examiner concludes that “it would have been obvious to modify Lauritzen et al US 4808738 to obtain the process parameters recited as the results [sic claims?], the use of somewhat different but otherwise analogous starting materials in an otherwise known process would not have been unexpected and therefore obvious” (Ans. 7).

Appellants argue that “[i]t has unexpectedly been found that the catalysts of the present invention retain their selectivity better” (App. Br.

10). Appellants argue that

catalysts having a low rhenium content, as defined in claim 1 (e.g., Catalysts A and B), unexpectedly have an increased service life and eventually a higher selectivity when operated in an olefin epoxidation process according to claim 1 as compared to a catalyst (e.g., Catalyst F) which has a

higher rhenium surface density and higher initial selectivity operated at increasing values of relative quantity Q.

(App. Br. 10).

Appellants argue that Lauritzen '850 "teaches that catalysts containing silver and rhenium have longer catalyst lives when the chlorohydrocarbon moderator level is increased over the period of operation of the catalyst." (App. Br. 12). Appellants argue that Lauritzen '850 "teaches away from maintaining constant the relative quantity Q of the organic halide when operating a rhenium-containing catalyst" (App. Br. 12).

Appellants argue that "[i]t is also unexpected that the process of the present invention results in catalysts, as defined in claim 1, outperforming conventional epoxidation catalysts (rhenium-free catalysts), producing more olefin oxide over their lifetime" (App. Br. 15).

In view of these conflicting positions, we frame the obviousness issue before us as follows:

Have Appellants demonstrated that the Examiner erred in finding that the claims are obvious over the combined disclosures of the prior art?

Findings of Fact (FF)

1. Lauritzen '738 teaches

a catalyst for the production of ethylene oxide from ethylene and molecular oxygen in the vapor phase which catalyst comprises a catalytically effective amount of silver, a promoting amount of alkali metal, a promoting amount of rhenium and a promoting amount of a rhenium co-promoter selected from sulfur, molybdenum, tungsten, chromium and mixtures thereof supported on a porous, refractory support.

(Lauritzen '738, col. 2, ll. 3-11).

2. Lauritzen '738 teaches a carrier B "which according to Table 1 is an alpha alumina support having a B.E.T. surface area of 0.42 m²/g" (Ans. 4; Lauritzen '738, Table 1).

3. Lauritzen '738 teaches that "[c]atalyst support Example B described in Table 1 is a preferred support for the instant invention and is used in the following examples and illustrative embodiments unless otherwise stated" (Lauritzen '738, col. 18, ll. 50-53).

4. Lauritzen '738 teaches that a "all catalysts listed in Table 5 have cesium levels which give the optimum (highest) initial selectivity obtained under these test conditions for a catalyst made on this support with the indicated levels of silver, rhenium and sulfur" (Lauritzen '738, col. 22, ll. 17-21).

5. Table 5 of Lauritzen '738 is reproduced below:

TABLE 5						
EFFECT OF DIFFERENT RELATIVE AND ABSOLUTE AMOUNTS OF RE AND S ON CESIUM OPTIMIZED CATALYST PERFORMANCE						
Experiment No.	% w Ag	Cs, ppmw (Radiotracer Analysis)	Re Target Level, ppmw, (μmole/g)	S Target Level, ppmw, (μmole/g)	Initial S ₉₀ , %	Initial T ₉₀ , °C.
5-1	14.3	236	0	0	80.0	242
5-2	13.8	297	93(0.3)	0	80.4	246
5-3	13.9	360	186(1.0)	0	80.6	241
5-4	14.2	438	372(2.0)	0	81.9	248
5-5	14.5	486	465(2.5)	0	82.3	248
5-6	14.1	567	558(3.0)	0	82.5	248
5-7	14.0	634	744(4.0)	0	83.2	248
5-8	14.2	343	0	32(1.0)	83.8	263
5-9	12.7	423	186(1.0)	32(1.0)	82.9	254
5-10	14.1	552	372(2.0)	32(1.0)	84.3	254
5-11	13.8	505	186(1.0)	64(2.0)	82.0	273
5-12	12.8	513	372(2.0)	64(2.0)	81.7	274

Table 5 discloses the effects of rhenium and sulfur on catalysts whose cesium levels are optimized.

6. Table 5 of Lauritzen '738 discloses catalysts, including 5-2 with 0.5 μmole/g of rhenium and 13.8% by weight silver and 5-9, with 1

$\mu\text{mole/g}$ of rhenium, 1 $\mu\text{mole/g}$ of sulfur and 12.7 % by weight silver (*see* Table 5 of Lauritzen '738; FF 5). 1 $\mu\text{mole/g}$ of rhenium is equal to 1 mmol/kg rhenium.

7. The Examiner finds, for Example 5-2 of Table 5, that “[b]y calculation, the distribution of rhenium is 0.0012 mmol/m^2 [sic, m^2]” (Ans. 4). An analogous calculation by the Examiner for Example 5-9 yields a distribution of rhenium that is 0.0024 mmol/m^2 . Appellants do not dispute the Examiner’s calculation.

8. Lauritzen '738 teaches that in the synthesis reaction, the “initial reactor . . . temperature is 180°C. After 1 hour at this initial temperature, the temperature is increased to 190°C. for 1 hour, followed by 200°C. (1 hour), 210°C. (1 hour), 220°C. (1 hour), 227°C. (2 hours), 235°C. (2 hours), and 242°C. (2 hours)” (Lauritzen '738, col. 20, ll. 56-60).

9. Lauritzen '738 teaches that the “gas mixture passed through the catalyst bed . . . during the entire test run (including startup) consists of 30% ethylene, 8.5% oxygen, 7% carbon dioxide, 54.5% nitrogen, and 4.4 to 5.6 ppmv vinyl chloride” (Lauritzen '738, col. 20, ll. 51-55).

10. Shell teaches that “Catalyst A-5 was prepared in the same manner as Catalyst A-1 . . . The amounts of rhenium/lithium/hafnium oxychloride loaded on the carrier were 1.5/12.0/0.75 micromoles per gram of carrier. The cesium loading was 540 ppm” (Shell 23, ll. 10-16).

11. Shell teaches that “‘Alpha Alumina #1’ is an alpha alumina that had a median particle size of about 3 to about 3.4 microns, a BET surface area of about 0.9 to about 1.4 m^2/g ” (Shell 24, ll. 9-11).

12. The Examiner finds that Shell teaches “the use of the catalyst for the epoxidation of ethylene. . . . The temperature is increased during the catalytic process” (Ans. 6).

13. Evans ‘202 teaches, in an epoxidation process to produce ethylene oxide, that the “gas mixture . . . consists of 30% ethylene, 8.5% oxygen, 5% CO₂, 0.5 % argon, balance nitrogen, and 0.5 to 5 ppmv ethyl chloride” (Evans, col. 18, ll. 43-47).

14. Lauritzen ‘850 teaches that
the process is operated at a chlorohydrocarbon moderator level sufficient to provide the maximum selectivity to ethylene oxide and after the activity of the catalyst has declined sufficiently to cause operational problems to thereafter in a second period of operation increase the chlorohydrocarbon moderator level by an amount sufficient to cause a significant decrease in the selectivity of the catalyst to ethylene oxide and a corresponding increase in the activity of the catalyst.

(Lauritzen ‘850 2, ll. 38-42).

15. Habenschuss teaches that “[r]action systems generally deactivate over time, i.e., the activity of the catalyst begins to decrease as the process is carried out. Activity may be plotted as a function of time to generate a graph showing the aging behavior of the catalyst” (Habenschuss 6, ll. 29-33).

16. Habenschuss teaches that “activity can be increased by raising the reaction temperature” (Habenschuss 7, ll. 1-2).

17. Carlson teaches that “[t]o assure the attainment and maintenance of the desired reaction temperature, any suitable means may be

resorted to in order to supply heat to the reactant or to the reaction zone”
(Carlson 4, ll. 18-21).

18. Evans ‘324 teaches that:

the moderator concentration may be optimized repeatedly during operation if the maximum available selectivity is to be maintained. In the initial phase the concentration of the organic halides is typically in the range of from 0.5 to 10 ppmv, preferably from 2 to 8 ppmv of the total volume of the feed gas. In the further operation phase the concentration of organic halides is typically in the range of from 2 to 25 ppmv, preferably from 3 to 16 ppmv of the total volume of the feed gas.

(Evans ‘324 8, ll. 15-26).

19. Evans ‘324 teaches that “[i]n both the initial operating phase and the further operating phase, the optimal ethylene concentration may be determined by successively measuring, at a fixed value of w, the performance in terms of S and T of progressively raised concentrations of ethylene” (Evans ‘324 8, ll. 34-36).

Principles of Law

The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) secondary considerations of nonobviousness, if any. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). The Supreme Court has emphasized that “the [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative

steps that a person of ordinary skill in the art would employ.” *KSR Int’l v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

“[W]hen the question is whether a patent claiming the combination of elements of prior art is obvious”, *KSR* directs that “a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.” *Id.* at 417.

We determine the scope of the claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. Of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). *See, e.g., In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000) (“[D]uring examination proceedings, claims are given their broadest reasonable interpretation consistent with the specification.”). The properly interpreted claim must then be compared with the prior art.

A prior art reference is said to teach away from an Applicant’s invention “when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994).

Analysis

Claim Interpretation

Claim interpretation is at the heart of patent examination because before a claim is properly interpreted, its scope can not be compared to the prior art. To determine the instant claim scope, we must interpret the phrase

“relative quantity Q is the ratio of an effective molar quantity of active halogen species present in the feed to an effective molar quantity of hydrocarbons present in the feed” in claim 1.

The meaning of Q is therefore dependent upon the meaning of “effective molar quantity” of the active halogen species and of the hydrocarbons. During prosecution, claim terms are given their broadest reasonable interpretation as they would be understood by persons of ordinary skill in the art in the light of the Specification. Therefore, we first turn to the Specification to determine whether the meaning of the phrase “effective molar quantity” can be discerned.

The Specification teaches that “it may be preferred, when calculating Q, to replace the molar quantity of hydrocarbons by a –so-called-effective molar quantity of hydrocarbons” (Spec. 5, ll. 29-31). The Specification teaches that “[f]or the purpose of calculating the effective molar quantity of active halogen species present in the feed and the value of Q, the number of active halogen species present in the feed is deemed to be the number of halogen atoms present” (Spec. 14, l. 32 to 15, l. 2). The Specification teaches regarding the hydrocarbons that “the molar quantity of each of the hydrocarbons present is multiplied with a factor, before the molar quantities are added up to calculate the effective molar quantity of the hydrocarbons” (Spec. 16, ll. 7-11).

We therefore interpret the “effective molar quantity” in the calculation of Q as referring to the composition of the halogen or hydrocarbon species in the feed so that where different halogens or different hydrocarbons are added

into the reaction, the “effective molar quantity” is the value used to ensure that the Q ratio remains constant as required by Claim 1.

Claim 1

Lauritzen ‘738 teaches the use of a rhenium catalyst in an epoxidation reaction which may comprise 0.0012 mmole/m² of rhenium in combination with silver, on a carrier (FF 1-7). Lauritzen ‘738 teaches epoxidation of the olefin, ethylene, with oxygen and the use of a gas mixture with the organic halide, vinyl chloride, and the rhenium catalyst (FF 9). Lauritzen ‘738 teaches that the reaction temperature is increased as the reaction proceeds (FF 8). Lauritzen ‘738 also teaches that the gas mixture is the same throughout the entire run. Therefore the molar quantity of the halogen species in the feed relative to the molar quantity of the hydrocarbons would be fixed, as Lauritzen ‘738 specifically teaches the use of 30% ethylene and 4.4 to 5.6 ppmv vinyl chloride (FF 9). That disclosure anticipates claim 1’s “relative quantity Q which is maintained constant.”

The Shell, Lauritzen ‘850, Habenschuss, Carlson, and Evans ‘202 references either teach other iterations of the epoxidation reaction or reasons to vary temperature during the reaction (FF 10-17). Evans ‘324 teaches optimizing the values involved in Q, the amounts of halogen and hydrocarbon (FF 18-19).

We agree with the Examiner that “all of the features of independent claim 1 are disclosed in Lauritzen et al US 4808738” (Ans. 5). Lauritzen ‘738 is reasonably interpreted to satisfy all the limitations of claim 1, thereby making the remaining references cumulative. *See In re Boyer*, 363 F.2d 455, 458 n.2 (CCPA 1966) (in sustaining a multiple reference rejection under 35

U.S.C. § 103(a), the Board may rely on one reference alone without designating the affirmance as a new ground of rejection) (citation omitted); *In re McDaniel*, 293 F.3d 1379, 1385 (Fed. Cir. 2002) (“It is well settled that ‘anticipation is the epitome of obviousness.’”) (citations omitted).

Appellants argue that “[i]t has unexpectedly been found that the catalysts of the present invention retain their selectivity better” (App. Br. 10). Appellants point to Example 2 of the Specification (Spec. 24), which shows that Catalyst F with 0.0019 mmole/m² of rhenium had reduced service life relative to Catalyst A or B with 0.0010 mmole/m² of rhenium (*see* App. Br. 10-11). We have considered this data, but it is not persuasive of unexpected results for several reasons.

First, Lauritzen ‘738 directly satisfies the rhenium composition requirements of claim 1 (FF 1-7). The claims do not include any element which distinguishes the catalyst of Example 5-2 referred to by the Examiner, which falls within the scope of claim 1. Also, the unexpected results for Catalysts A and B include the copromoter tungsten at 0.35 mmole/kg while Catalyst F has 0.7 mmole/kg tungsten and Claim 1 makes no reference to the inclusion of copromoters and therefore encompasses all copromoters, not just tungsten. Therefore, the unexpected results are not commensurate in scope with the claim. *See In re Harris*, 409 F.3d 1339, 1344 (Fed. Cir. 2005) (“The Board also correctly reasoned that the showing of unexpected results is not commensurate in scope with the degree of protection sought by the claimed subject matter”).

Second, the comparison was not made with the closest prior art, the rhenium catalyst of Lauritzen ‘738. Appellants have not performed the

comparison with Example 5-2 of Lauritzen '738, which is closer prior art than Catalyst F because Example 5-2 uses an amount of rhenium which falls within the scope of the claims, while Catalyst F does not. Claim 1 also does not require copromoters such as the tungsten found in Catalyst F, and Example 5-2 does not include the sulfur copromoter. *See In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991) (“[W]hen unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art.”).

Claim 9

Appellants argue that the “art cited by the Examiner does not provide a reason, especially in light of the teaching of the ‘850 publication, that would have prompted a person of ordinary skill in the art to increase the reaction temperature during the epoxidation process . . . while the organic halide is present in a relative quantity Q which is maintained constant” (App. Br. 15).

We are not persuaded. Lauritzen '738 expressly teaches that in the synthesis reaction, the “initial reactor . . . temperature is 180°C. After 1 hour at this initial temperature, the temperature is increased to 190°C. for 1 hour, followed by 200°C. (1 hour), 210°C. (1 hour), 220°C. (1 hour), 227°C. (2 hours), 235°C. (2 hours), and 242°C. (2 hours)” (Lauritzen '738, col. 20, ll. 56-60; FF 8). This is an express teaching to increase the reaction temperature during the epoxidation process (FF 8).

Further, Lauritzen '738 expressly teaches that the “gas mixture passed through the catalyst bed . . . during the entire test run (including startup) consists of 30% ethylene, 8.5% oxygen, 7% carbon dioxide, 54.5% nitrogen,

and 4.4 to 5.6 ppmv vinyl chloride” (Lauritzen ‘738, col. 20, ll. 51-55). Lauritzen ‘738 does not suggest varying the amounts of any of the gas mixture components during the run (FF 9). Lauritzen ‘738 is therefore reasonably understood to teach that the ratio of organic halide, vinyl chloride, to the hydrocarbon, ethylene, is maintained constant through the reaction (FF 9).

Claim 17

Appellants argue that the limitation of Claim 17 that “the relative quantity Q has been maintained within at most 10% of the value of Q at the beginning of that temperature increase” is not taught or suggested by the cited art (App. Br. 16).

We are not persuaded for the same reason given above relative to Claim 9, which is that Lauritzen ‘738 does not suggest varying the amounts of any of the gas mixture components during the run (FF 9). Lauritzen ‘738 is therefore reasonably understood to maintain, within 10%, the ratio of the organic halide, vinyl chloride, to the hydrocarbon, ethylene, constant through the reaction (FF 9). Appellants have provided no evidence which demonstrates that Lauritzen ‘738 does not maintain the ratio within the required 10% of Claim 17.

Claim 19

Appellants argue that “Example 2, see above, shows that, at the lower content of rhenium, the catalysts of the present invention unexpectedly have an increased service life and eventually produce the olefin oxide at a higher selectivity than the catalysts which have higher rhenium content/higher rhenium surface density and higher initial selectivity” (App. Br. 17).

We are not persuaded. Example 5-9 of Lauritzen '738 differs from the catalyst claimed in Claim 19 in one way and the catalyst in Example 2 of the Specification in two ways. Example 5-9 of Lauritzen '738 teaches a catalyst comprising silver, rhenium, and the rhenium copromoter sulfur, which is deposited on a carrier, and which has a rhenium surface density of 0.0024 mmole/m^2 and where the rhenium copromoter of sulfur is present in a quantity greater than 0.1 mmole/kg (FF 5-7).

So Example 5-9 of Lauritzen '738 differs from Claim 19 in having a density which is 0.0024 mmole/m^2 , not at most 0.0015 mmole/m^2 as listed in the claim. Example 5-9 of Lauritzen '738 differs from Example 2 of the Specification in using a different copromoter, since Example 2 used tungsten, as well as a different amount of rhenium (FF 5-7).

We are not persuaded by Appellants' unexpected results, because these results were neither commensurate in scope with the claim nor compared the closest prior art. That is, the results in Example 2 of the Specification were performed solely with catalysts which used the copromoter tungsten, but claim 19 expressly permits the use of other copromoters including molybdenum, chromium, sulfur, phosphorus, and boron (Claim 19) and is therefore not limited to tungsten. *See In re Harris*, 409 F.3d 1339, 1344 (Fed. Cir. 2005) ("The Board also correctly reasoned that the showing of unexpected results is not commensurate in scope with the degree of protection sought by the claimed subject matter").

We also are not persuaded by Appellants' unexpected results because they did not establish it was compared to a prior art example which was closer than Lauritzen '738, with a sulfur copromoter, which would represent

the closest prior art. Instead of showing that reducing the rhenium content in Example 5-9 of Lauritzen '738 to 0.0015 mmole/m² with a sulfur copromoter would improve the properties, the comparison of Example 2 was performed with a different copromoter (as well as other differences in conditions). *See In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991) (“[W]hen unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art.”).

Conclusion of Law

Appellants have not demonstrated that the Examiner erred in finding that the claims are obvious over the combined disclosures of the prior art.

SUMMARY

In summary, we affirm the rejection of claims 1, 9, 17, and 19 under 35 U.S.C. § 103(a) over Lauritzen '738, Shell, Evans, Lauritzen '850, Habenschuss, Carlson, and Evans. Pursuant to 37 C.F.R. § 41.37(c)(1)(vii)(2006), we also affirm the rejection of claims 2-8, 10-16, 18, and 20-30 as these claims were not argued separately.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv)(2006).

Appeal 2009-013266
Application 10/816,080

AFFIRMED

alw

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